

1.5 Assessing health impacts on a population

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Objectives

By reading this chapter you will become familiar with:

- the background and policy context of health impact assessment (HIA)
- current and emerging concepts and methods of HIA
- the impact of HIA
- an approach to conducting rapid and comprehensive prospective HIAs on major public policies, programmes, and projects.

Definition and scope

Health impact assessment is 'a combination of procedures, methods and tools by which a policy, programme or project may be judged as to its potential effects on the health of a population, and the distribution of those effects within the population'.¹ Health impact assessment may focus on projects such as a new factory, housing development or health centre, programmes such as crime reduction or urban regeneration, or policies such as an integrated transport strategy or a youth unemployment policy. On a broader scale, HIA can be employed to assess global public policies in areas such as international trade, war, and human rights. (Compare HIA as a method with health needs assessment by referring to Table 1.3.1.)

Health impact assessment builds on the fact that a wide range of economic, social, psychological, environmental, and organizational influences determines a community's health. It is important to try to estimate these influences on health *prospectively* and so HIA should precede the start of the project, programme, or policy concerned.

The aims of prospective HIA are:

- to systematically assess the potential health impacts, both positive and negative, of projects, programmes, and policies
- to improve the quality of public policy decisions by making recommendations that are likely to enhance predicted positive health impacts and minimize negative ones.

The key output of an HIA is a set of recommendations for beneficially modifying a proposal so that its overall health impacts are enhanced and any potential health inequalities are minimized.

The importance of health impact assessment

Health impact assessment is an important public health method because it:

- promotes equity, sustainability, and healthy public policy in an unequal and frequently unhealthy world
- improves the quality of decision-making in health and partner organizations by incorporating into planning and policy-making the need to address health issues
- emphasizes social and environmental justice (it is usually the already disadvantaged who suffer most from negative health impacts)
- involves a multidisciplinary approach
- encourages public participation in debates about public health, planning, and other public policy issues
- gives equal status to qualitative and quantitative assessment methods
- makes values and politics explicit and opens issues to public scrutiny
- demonstrates that health is far broader than health-care issues.

Health impact assessment is used in public policy decision-making in a wide and rapidly increasing range of 'developed' and 'less developed' countries throughout the world. Health impact assessment has had a high profile in countries of the South since the 1980s.² The remainder of this section documents more recent developments in the North.

Europe

The UK,^{3,4} The Netherlands, and Sweden were the first countries in Europe to establish HIA programmes. In The Netherlands, HIA became government policy in 1995, following which a screening programme on new policy and legislation was introduced. In Sweden, HIA has been used since 1998 at local government level to assist in achieving local public health targets. The World Health Organization's (WHO) European Centre for Health Policy, together with other European partners, initiated a project in 1999 to bring together available experience and try to reach a degree of consensus on how HIA can best be used to improve health policy development. The most important outputs of this project have been the Gothenburg consensus statement¹ and the generally raised levels of awareness of HIA both in European countries and in the European Commission (EC).

There has been considerable interest in the European Union (EU) in incorporating HIA into the development of all EU policy. In 2001 the EC Directorate General for Health and Consumer Protection (DG Sanco) commissioned the development and piloting of a methodology for HIA of European policy. The resulting European Policy Health Impact Assessment (EPHIA) guide was published in 2004.⁵

The EC has also published and implemented proposals for the integrated impact assessment (IIA) of all EU policy.⁶ Integrated impact assessment implies the relatively superficial impact assessment of policies on a number of different dimensions. This was partly a response to the range of assessments, for example environmental, health, gender, economic, being carried out on new European policies.

United Kingdom

The UK government is strongly committed to the principle of HIA. Most recently, the 2004 English public health White Paper *Choosing Health* reiterated the importance of HIA for assessing national and local policies, programmes, and projects. The devolved governments in Scotland and Wales have commissioned substantial programmes of HIA, and the Greater London Assembly has carried out HIAs on London's culture, urban renewal, transport, energy, housing, and waste management strategies. The establishment in England in 2002 of Primary Care Trusts, whose directors of public health are responsible for undertaking HIAs, has led to HIAs being undertaken as part of the capital planning process within the NHS. The UK Faculty of Public Health has included HIA as a core competency for all public health professionals.

The UK's National Institute for Health and Clinical Excellence (NICE) HIA Gateway (<http://www.publichealth.nice.org.uk/page.aspx?o=HIAGateway>) has enabled HIA practitioners to share good practice and lessons learned from undertaking HIA as well as acting as an evidence base for HIA practice and evaluation. The former Health Development Agency has also commissioned work on the development of rapid appraisal and integrated impact assessment methods.⁷

North America

In Canada, health has featured within environmental impact assessments (EIAs) since the 1980s. Health impact assessment as a separate procedure was first incorporated into the legislative framework of British Columbia in 1993, though this pioneering initiative subsequently lapsed. Health impact assessment has since been introduced in a number of Canadian provinces, including Nova Scotia and Quebec.

In the USA, while health considerations have similarly played a role within EIA, HIA has been slow to emerge. Pioneering projects have been undertaken in California (San Francisco and Los Angeles) and in Minnesota. In 2002 a meeting was organized at the Harvard School of Public Health to assess the possibilities for HIA within the USA.⁸ In 2004 the Centres for Disease Control and the Robert Wood Johnson Foundation held a further meeting to consider the potential for HIA in local public health and planning departments.

Australasia

Both Australia and New Zealand developed health-focused EIA in the 1990s. More recently, in 2004, the New Zealand government launched a policy tool for HIA.⁹ In the same year an Australian–New Zealand collaborative project developed and piloted an equity-focused HIA approach.¹⁰

Globally

At a global level, the WHO has appointed a HIA adviser at its Geneva headquarters, and has published a special issue of its *Bulletin*¹¹ on HIA. The WHO has also played a major role in promoting the consideration of health within strategic environmental assessment (SEA). Strategic environmental assessment is concerned with the strategic impact of policies and has been the subject of recent policy and legislation by the EC and by the UN Economic Commission for Europe.

Health impact assessment is increasingly used by global agencies such as the World Bank and by transnational corporations like Shell, which recently appointed a global HIA adviser. Its potentially important role in global public policy is beginning to be recognized.^{12,13}

The HIA process

Advantages

As the number of HIA studies grows, accumulating evidence shows that HIA can draw attention to potential health impacts in a way which permits constructive changes to be made to project or policy proposals. This has potentially enormous benefits for major developments which are costly or which propose significant change to existing service provision or organization.

Disadvantages

However, potential drawbacks to the adoption of HIA as a routine part of planning include the limited capacity and capability to undertake HIA. Therefore, whilst this chapter describes a comprehensive approach to HIA, we appreciate that time and resources may dictate a more condensed approach. There has been considerable interest in the development of rapid HIA among a number of researchers including Ison¹⁴ who has described participatory and non-participatory techniques, Milner¹⁵ who has developed a screening tool for rapid HIA and Ardern,¹⁶ who has developed a rapid HIA tool which has been used on a major housing programme and on NHS capital schemes.

In both comprehensive and rapid HIA, it is important to distinguish between *procedures* and *methods* for health impact assessment (see Figure 1.5.1):

- procedures are frameworks for commissioning and implementing HIAs
- methods are the systems for carrying them out.

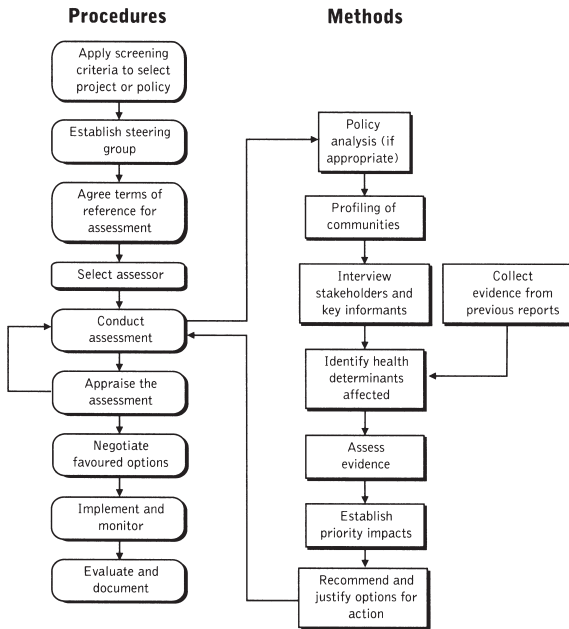


Figure 1.5.1 Stages in the HIA process

Managing an HIA: procedures

There are four procedures in the HIA process

- screening
- steering group, terms of reference, and scope of HIA
- negotiation of favoured options
- implementation, monitoring, and evaluation.

Screening

The issues on which the selection of candidates for HIA is based are listed below. Potential projects, programmes, or policies should be rapidly assessed with regard to their likely performance in relation to each of these issues. While the procedure is necessarily crude, it can give a useful indication of how resources for HIA can be most effectively deployed. For the remainder of the sections describing procedures and methods, the term 'project' is used to refer to projects, programmes, or policies.

Health impact assessment screening procedure:

- *Economic issues*
 - the size of the project and of the population(s) affected
 - the costs of the project, and their distribution.

- *Outcome issues*
 - the nature of potential health impacts of the project
 - the likely nature and extent of disruption caused to communities by the project
 - the existence of potentially cumulative impacts.
- *Epidemiologic issues*
 - the degree of certainty (risk) of health impacts
 - the likely frequency (incidence/prevalence rates) of potential health impacts
 - the likely severity of potential health impacts
 - the size of any probable health service impacts
 - the likely consistency of 'expert' and 'community' perceptions of probability (i.e. risk), frequency and severity of important impacts.

The greater the agreement between expert and lay perceptions of important impacts: the greater the need for a HIA.

During HIA screening, there is a general need to give greater priority to policies than to programmes, and to programmes than to projects, all other things being equal. This is due to the broader scope—and hence potential impact—of policies as compared with programmes and to projects. Another strategic consideration is that HIA should be prospective wherever possible. Timing may be affected by planning regulations and other statutory frameworks, such as whether the project requires an environmental impact assessment. The relevance of the HIA to local decision-making is another key concern.

Steering group, terms of reference, and scope

Following screening and project selection, a multidisciplinary steering group should be established to agree the terms of reference (ToR) of the HIA and to provide advice and support as it develops. Its membership should include representatives of the commissioners of the HIA, the assessors carrying it out, the project's proponents, affected communities, and other stakeholders as appropriate. Members should ideally be able to take decisions on behalf of those they represent.

The ToR provide a quality assurance procedure for the HIA. They are project specific, but should always include:

- steering group members' roles, including those of chair and secretary
- the nature and frequency of feedback to the steering group
- the HIA methods to be used
- the form of the project's outputs and any associated issues, e.g. ownership, confidentiality, and copyright
- the scope of the HIA—what is to be included and excluded, and the boundaries of the HIA in time and space
- an outline programme, including any deadlines
- the budget and source(s) of funding.

Negotiation of favoured options

The consideration of alternative options does not conclude the process. Even when there appear to be clear messages regarding the best way forward it cannot be assumed that these will automatically be adopted. Achieving agreement on options for mitigating or enhancing predicted health impacts may require skillful negotiation on the part of those involved.

Implementation, monitoring, and evaluation

To some extent, a HIA is analogous to an audit cycle in which the results of subsequent monitoring and evaluation in turn influence the continuing operation of the project. The indicators and methods proposed for monitoring will depend on the nature and content of the project, and also on the perceived importance of this stage of the assessment. A tool which can be used for monitoring the distribution of impacts on a given population is *health equity audit*, with its local indicators of health inequalities. The former Health Development Agency has published a helpful guide to evaluation of HIAs.¹⁷

In HIA, outcome evaluation is constrained by the fact that negative impacts which have been successfully avoided (or weakly positive ones which have been successfully enhanced) due to the modification of the project will clearly not be identifiable. In practice, things are rarely this perfect and it may be possible to construct and compare notional and actual outcomes relating to the originally proposed and actual post-HIA projects. Multimethod assessments of specified outcomes (*triangulation*) should be undertaken where feasible, in order to increase validity.

Process evaluation involves the assessment of HIA procedures and methods against the terms of reference initially agreed by the steering group; impact evaluation involves the assessment of the extent to which the agreed recommendations of the HIA were successfully implemented.

A consistent finding of a number of studies is that undertaking HIA has produced unpredicted beneficial outcomes such as improved local partnerships, raising the profile of health issues on the political agenda, reducing social exclusion, empowering and engaging local communities, and improving and informing the quality of local decision-making. For example, the HIA of the New Home Energy Efficiency Scheme in Wales¹⁸ demonstrated the programme's relevance to other key health determinants such as crime and disorder and accidents and injuries. These unexpected outcomes require systematic recording and follow-up. Evaluation of a HIA needs ideally to incorporate methods that can capture this, such as film and photography. The HIA of the New Deal for Communities programme in Huyton, Merseyside, UK¹⁹ is an example of the use of these techniques in HIA evaluation.

Methods for assessing health impacts

The range of methods used for HIAs should reflect the nature and complexity of the subject matter. It is important to use all methods and involve all disciplines that may contribute to the overall task. Commonly used methods include:

- policy analysis
- profiling of affected areas/populations
- identification of potential positive and negative health impacts
- assessment of perceived health risks
- quantification and valuation of health impacts
- ranking the most important impacts

- consideration of alternate options and recommendations for management of priority impacts.

Before looking at these methods, we will discuss the key area of participation.

Participation in HIAs

The process of HIA requires broad participation if a comprehensive picture of potential health impacts is to be established. Public participation throughout the HIA is essential, both to ensure that local concerns are addressed and for ethical reasons of social justice. The cooperation and expertise of a wide range of stakeholders and key informants will be needed, including:

- those involved at all levels in the project
- those likely to be directly affected by the project
- others who have knowledge or information of relevance to the project and its outcomes, e.g. local shopkeepers or service providers, community groups
- local or outside experts whose knowledge is relevant to the project
- relevant professionals, e.g. general practitioners, health visitors, social or community workers
- voluntary organizations.

Barnes²⁰ has identified the importance of using robust and well-planned methods of community participation in adding value and credibility to HIA recommendations. She also highlights the need for HIA practitioners to understand and record people's health experiences which underlie routinely collected statistics. Exclusive reliance on quantitative methods may oversimplify the complexity of real life situations.

Policy analysis

Health impact assessments of policies will require initial policy analysis to determine key aspects that the HIA will need to address; this may build on or use material already available from earlier policy development work.⁵ Key aspects include:

- content and dimensions of the policy
- socio-political and policy context
- policy objectives, priorities, and intended outputs
- trade-offs and critical socio-cultural impacts which may affect its implementation.

Profiling of affected areas/populations

A profile of the areas and populations likely to be affected by the project is compiled using available socio-demographic and health data and information from key informants across the public and non-statutory sectors. The profile should cover groups whose health could be enhanced or placed at risk by the project's effects. Vulnerable and disadvantaged groups require special consideration.

Identification of potential positive and negative health impacts

Table 1.5.1 Health determinants encountered in health impact assessment

Categories of influences on health	Examples of specific health determinants
Biological factors	Age, sex, genetic factors
Personal and family environment	Family structure and functioning, primary/secondary/adult education, occupation, unemployment, income, risk-taking behaviour, diet, smoking, alcohol, substance misuse, exercise, recreation, means of transport (cycle/car ownership)
Social environment	Culture, peer pressures, discrimination, social support (neighbourliness, social networks, isolation), community/cultural/spiritual participation, crime
Physical environment	Air/water quality, noise, smell, view, housing conditions, working conditions, public safety, civic design, shops (location/range/quality), communications (road/rail), land use, waste disposal, energy, local environmental features
Public services and public policy	Access to (location/disabled access/costs), quality of primary/community/secondary health care, child care, social (security) services, housing, leisure amenities, employment, public transport, law and order, other health-relevant public services, non-statutory agencies and services, equity/democracy in public policy.

The range of potential health impacts identified in a HIA depends on the definition of health that is employed. Like most governments and the World Health Organization, we recommend using a socio-environmental model which features a wide range of linkages by which projects can impact upon health, and a causal model of health impact in which a project changes the prevalence of health determinants and this, in turn, may change the health status of the affected population groups. Table 1.5.1 presents the health determinants most often encountered in HIA.

Methods for identifying the potential health impacts of a project will vary according to the human and financial resources available. Clearly, a short workshop discussion involving a group of stakeholders around a table will employ different methods from a comprehensive assessment. Ideally, impact identification should involve qualitative fieldwork (typically interviews, focus groups, and sometimes Delphi studies or scenarios) and quantitative studies such as mathematic modelling of project outcomes, surveys, and economic analysis.

Respondents will include relevant experts and purposive samples of key informants, including affected subpopulations. Literature searches are also employed in impact identification. The essential aim, whichever methods are used, is to systematically consider the range of potential changes to health determinants and outcomes likely to result from the operation of the project.

Assessment of perceived health risks

Perceptions of risk are, when possible, recorded at the time of identification of potential impacts. In some instances existing evidence will permit precise assessment of risk. In many cases, however, risk assessment will be based on subjective perceptions. Assuming adequate sampling, such subjective risk data are arguably no less valid or important than are more precise technical data—particularly where sensory perceptions (such as increased noise or smell, or deterioration of outlook) are concerned. Petts *et al.*²¹ have produced a useful guide to understanding what influences people's assessment of risk.

Risk perceptions can be recorded using simple three-point scales of measurability (potential impacts are characterized as qualitative, estimable, or calculable) and of likelihood of occurrence (definite, probable, or speculative). The temptation to quantify such scales should be resisted—such numbers could not be compared or manipulated with validity and would carry a spurious authority.

Quantification and valuation of health impacts

It may prove possible to assess the size of quantifiable impacts at the time they are identified by informants; in other cases this will need to be done separately, e.g. through reviews of previously published evidence. The same applies to valuation—though evidence on the resource implications and opportunity costs of potential impacts will often prove hard to come by. However, such data can in principle be made comparable using quality-adjusted life years (QALYs) or disability-adjusted life years (DALYs), or other such cost–utility measures. Some authors have described mathematic modelling methods used to quantify health impacts, particularly in relation to environmental impacts on health such as air pollution, road accidents, and methods of waste disposal. The Foresight Vehicle Initiative HIA undertaken for the UK's Department of Trade and Industry²² used modelling and health and transport economic forecasting to quantify the health impacts of innovations in road transport technology.

Ranking the most important impacts

Informants should be encouraged to prioritize or rank those potential impacts that they identify. Once all the initial evidence has been collected, a priority-setting exercise should be carried out. Because of differential perceptions of risk there will rarely be complete consensus; criteria may need to be agreed so that the views of all informants are adequately reflected and valued. Such criteria are likely to include the frequency with which potential impacts are identified, the probability of occurrence, severity/importance, and public and political opinion.

Consideration of alternative options and recommendations for management of priority impacts

Unless there is total consensus, a series of options for providing the optimum health impact of the project being assessed should be defined and presented. The ultimate result will be an agreed set of recommendations for modifying the project such that its health impacts are optimized—in the context of the many and complex constraints which invariably constitute the social, material, and political environment in which it will be undertaken.

Communicating with key stakeholders is critical to the success or otherwise of an HIA. There are often political and organizational systems that require formal feedback such as local authority committees, health service boards, and local strategic partnerships. An HIA which is submitted to a planning enquiry will sometimes require a nominated senior officer to give evidence.

Recommendations

If HIA is going to be a worthwhile exercise it is crucial that it is able to demonstrate both effectiveness and efficient use of resources. Therefore it follows that any recommendations resulting from HIA studies should:

- be practical
- aim to maximize health gain and minimize health loss
- be socially acceptable (a degree of pragmatism may be inevitable)
- consider the cost of implementation
- consider the opportunity cost
- include preventive as well as curative measures
- be prioritized in terms of short-, medium-, and long-term objectives
- identify a lead agency or individual
- identify the drivers and barriers to change
- be acceptable to the lead agency
- be capable of being monitored and evaluated.

The list given above is, of course, not definitive and as HIA develops other criteria will be added. Too often, however, recommendations are of a general rather than a specific nature which makes monitoring difficult if not impossible. Also, if there was poor teamwork the recommendations may only reflect one person's viewpoint and may fail to appreciate the logistics of implementation. It will also mean that key agencies do not feel that they have ownership of the recommendations.

The impact of HIA

Health impact assessment has now been carried out on a number of major policies, programmes, and projects and has had significant influence on policy-making and planning. Examples include the Greater London Assembly's HIA programme¹⁷, the Fingley airport study²³ conducted by Doncaster Health Authority (which for the first time in the UK incorporated the establishment of an independent airport health impact group into the regulatory framework for an airport), and the St Helens and Knowsley PFI study¹⁶ which was instrumental in attracting significant

additional financial investment in the scheme at reduced interest rates from the European Investment Bank.

Some conceptual and methodological issues

Science or art?

Health impact assessment is a decision support process which draws on a scientific knowledge base. Each HIA is specific to a location in time, space, and local conditions—though its evidence base can be evaluated, and the rigor with which procedures and methods are implemented can (and should) be assessed.

Uncertainty

Uncertainties encountered during the undertaking of HIAs frequently dictate the need to make assumptions: these are often acceptable but should be declared explicitly.

Timing

Health impact assessment should take place early enough in the development of a project to permit constructive modifications to be carried out prior to its implementation, but late enough for a clear idea to have been formed as to its nature and content.

Depth

The financial and opportunity costs of undertaking HIA dictate the need both to screen candidate projects and also to have available a range of methods according to the depth of analysis required.

Politics

Although HIA is itself part of the political process, external political imperatives may sometimes inappropriately determine the outcome of the decision being assessed. Disagreements or power inequalities between different stakeholder factions may be similarly important. Health impact assessments will often be taken out of context to justify pre-set political positions. None of this 'policy-based evidence making' should deter us from continuing to use this innovative approach to promote healthy public policy.

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